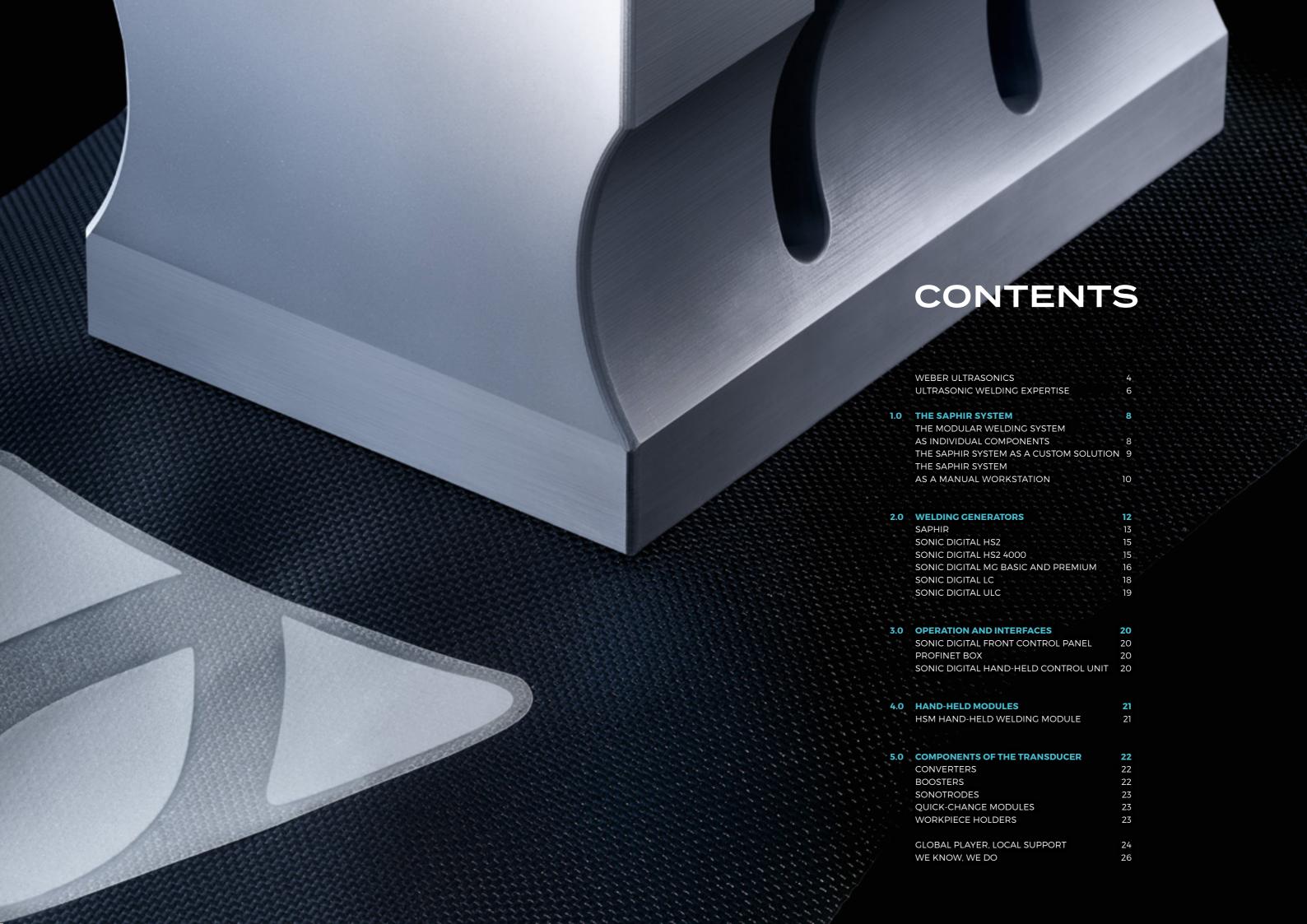
WEBER ULTRASONICS

## THE BEST BOND

**ULTRASONIC WELDING** 





»Welding with ultrasound is fast and cost-effective. We make it smart and bring it in line with Industry 4.0. After all, our customers expect perfect system solutions for highly efficient production processes.«

Dieter Weber



Dieter Weber, Chairman of the Supervisory Board Markus Weber, Chief Innovation Officer

# A QUANTUM LEAP IN MANUFACTURING

PIONEERING JOINING TECHNOLOGY FOR INDUSTRY 4.0

Shorter cycle times, greater process stability and better quality – welding with ultrasound has revolutionised modern production processes. The precise and reliable joining technology is a powerful innovation driver in many industry sectors. Customers can now choose from innovative combinations of materials. And uninterrupted welded joints have proven successful in continuous operation.

Even when working with large batch sizes, welding with ultrasound ensures connections that comply with the very highest quality requirements. Our welding technologies are fit for Industry 4.0 and can be ideally integrated in automated production lines.

For industry and plant manufacturers, we are the development partner with indepth ultrasound expertise. As a technology leader from Germany we set new standards when it comes to welding, cutting and cleaning with ultrasound. Thanks to our intensive research we are expanding the range of applications for ultrasound and thereby preparing the ground for innovative manufacturing processes and new technological processes.

Weber Ultrasonics offers technology and service from a single source: with certified quality, developed and manufactured in state-of-the-art production facilities in Germany. The company's portfolio comprises ultrasonic components such as generators or sonotrodes, as well as complete, turnkey systems with integrated quality control and individual additional functions. Concise customer training courses and a unique customer service with ultra-fast spare part delivery round off the portfolio.

#### WE DRIVE INNOVATION

4 WEBER ULTRASONICS



An eye on the full picture: synchronised welding with integrated quality control

As ultrasound specialists, we think in terms of holistic production processes. For example, we develop customer-specific units with integrated quality control with the modular SAPHIR welding system at their heart. These allow customers from a broad range of industry sectors to optimise their production processes efficiently while also ensuring high flexibility.

At PLAYMOBIL®, for example, the head-pieces of the globally popular toy figures from the 1.2.3. series for infants are welded so that they are inseparable from the heads using a SAPHIR welding system from Weber Ultrasonics. Meanwhile, indexed workpiece holders ensure that the welding parameters are met without the need to perform readjustments. When new headpieces are added to the range, a new workpiece holder simply needs to be designed before mass production can commence. Tension and height measurements integrated into the welding station aid quality control.

Finally, an ultrasonic sonotrode marks each workpiece for the purpose of quality documentation.

We have also developed a flexible solution with integrated quality control for Gbr. Schwarz GmbH. The manufacturer of display covers for electronic devices embeds metallic threaded bushings in thermoplastic polymer using ultrasound. In the welding station the threaded bushings are positioned in the intended recesses before a sonotrode moves over them and embeds them. All processing parameters and a photo of the finished workpiece are gathered and saved for documentation purposes. The welding station is freely programmable so that the changeover to new display covers can be achieved with a minimum of effort.



## ASTOUNDINGLY PRODUCTIVE

**CONTINUOUS WELDING: CLEAN, FAST, RELIABLE** 

Continuous welding of web materials at more than 400 m per minute is a reality in many applications thanks to ultrasonic solutions from Weber Ultrasonics. But speed is not everything. Thanks to the highest level of process reliability and compatibility with Industry 4.0, customeroriented solutions are created that are perfectly integrated in highly automated production processes.

The welding, laminating, cutting and embossing of non-woven and web materials with ultrasound offers numerous advantages compared to thermal solutions or adhesive processes. Ultrasound is more reliable, productive, cost-effective and safe. Continuous welding with ultrasound is the procedure of choice in many industries: for hygiene products such as nappies or panty liners, medical products including masks or sterile packaging, for air and fluid filters, roof underlays or disposable gloves

Continuous welding with ultrasound guarantees soft and flexible surfaces, as no radiant heat that causes hardening occurs during welding. The energy is used precisely and in a targeted manner so that web materials do not become warped. Cross seams required for hygiene products are implemented perfectly thanks to this precision. What's more, temperatures remain low despite long process times. Unlike thermal procedures in which the tools are permanently heated, there is no risk of fire.

There is no need for adhesives when using ultrasound. This raises the added value of products, as some adhesive ingredients can trigger allergies. People sensitive to these therefore prefer to use adhesive-free hygiene products. Moreover, when ultrasound is used, no adhesive residues build up on rollers and pulleys in production. The process is cleaner and more environmentally friendly. Compared to thermal procedures, energy consumption is minimal and the purity of the materials makes recycling easy.



Today, components made of thermoplastics and meshes are used in virtually all industry sectors, from the automobile industry, through electrical and hygiene products, all the way up to the medical, textile and packaging industries. State-of-the-art ultrasonic welding systems not only guarantee top cost-effectiveness and reliability, but also stand out thanks to their high flexibility in customer-specific applications.

The innovative SAPHIR SYSTEM from Weber Ultrasonics sets new standards here. Manufactured and preconfigured specially for you, it is available as a manual workstation, an individual combination of components or a custom solution perfectly tailored to your requirements.

As well as functioning as an independent welding unit, the SAPHIR system particularly excels in a network with other devices. This allows machine concepts with up to 25 different functions to be set up - ranging from the actual welding procedure, visual and mechanical checks, right through to sorting processes. There are therefore virtually no limits to your engineering ideas!

#### 1 TOUCH PC

The 15" touch-sensitive control module is equipped with SAPHIR CONTROL 4.0, a comprehensive and intuitive software solution for Windows, and offers full control and monitoring of all important functions of the SAPHIR system at all times. This is where you define the optimal parameters for your processes.

#### 2 GENERATOR

The heart of the SAPHIR system is the digital generator with a power output of up to 5000 watts. This is available in three standard frequencies of 20 kHz, 30 kHz and 35 kHz. The device works reliably in ambient temperatures of -10 to +40 °C and can be integrated into your system with a minimum of effort thanks to its compact design.

#### FEED UNIT AND SONOTRODE

The compact and robust design of the feed unit makes it easy to integrate into every automation process. It is individually matched to welding sonotrodes for 20 kHz, 30 kHz and 35 kHz and is also available in a more compact version. Furthermore, the customer-specific development of the sonotrodes using the finite element method and high-quality materials means that even the toughest functional and quality requirements are met.

## ONE CONCEPT, MAXIMUM FLEXIBILITY

MULTIFUNCTIONAL - YOUR SYSTEM PLANNING WITH THE SAPHIR SYSTEM AS A CUSTOM SOLUTION

Our special strength is our engineering competence, something we demonstrate by designing individual systems developed together with you specially for your industry and requirements. Our flexible machine concept with high-quality ultrasound and mechanical components makes it possible to implement even the most demanding applications perfectly.

You will receive a turnkey system manufactured in line with the DIN ISO 9001 guidelines with sound-proofing, enclosures, rotary indexing plates and all desired additional functions, such as a quality check or the option to perform different welding processes in succession.













THE SAPHIR SYSTEM AS A MANUAL WORKSTATION

**PLUG & PLAY** 

The space-saving plug-and-play all-rounder is already preconfigured and ready for use. It offers a multitude of possible applications and configurations, can be operated as a partially automated process or as an independent single workplace and is equipped with quality components from Weber Ultrasonics.



FUNCTIONAL CONFIGURATION
OF THE SAPHIR SYSTEM

#### > EASE OF USE

Control and monitor all important functions and parameters via the touch PC with the intuitive SAPHIR CONTROL 4.0 software and a graphical process display.

#### > PLAYING IT SAFE

Interfaces such as Ethernet, PROFINET and PROFIBUS enable remote maintenance, data export and automatic backups.

#### > PROGRAM STORAGE

The SAPHIR system allows you to save up to 200 welding programs.

#### > DURABLE AND ROBUST

All components from Weber Ultrasonics impress thanks to their ease of maintenance and intelligent product design.

### > MAXIMUM FLEXIBILITY

Take care of a wide range of welding and handling tasks using a single unit. The intelligent changeover system ensures fast product and tool changeovers.

#### > VERSATILE IN ALL VARIANTS

Use the SAPHIR system as a space-saving stand-alone device by integrating single components or as an individual unit specially tailored to your requirements.

#### > DIGITAL POWERHOUSE

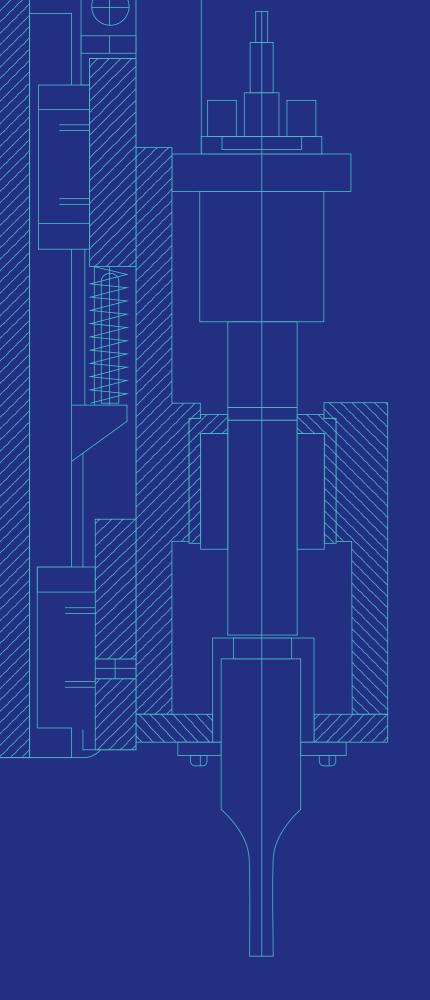
5000 watts of power output give you lots of leeway when using your SAPHIR machine.

Power outputs and frequencies: 35 kHz: 400 to 1200 watts 30 kHz: 400 to 1500 watts 20 kHz: 400 to 5000 watts

#### > POTENTIAL FOR MORE

Whatever you are planning for the future, the SAPHIR system grows with your requirements.





Setting the pace for your individual welding solution: pioneering ultrasonic systems. For uncompromising quality and unbridled productivity.



Available in the two most common frequencies - 20 kHz and 35 kHz - and with a maximum power output of up to 5000 watts, the SAPHIR generator is a real powerhouse. Yet it is also easy to store thanks to its compact design.

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- High power output of up to 5000 watts
- SonoScan
- Digital frequency generation and control through 32-bit microcontroller
- Electronic amplitude control from 50 % to 100 %
- Control and monitoring of all functions via Windows touch PC
- Programmable operating parameters for up to 99 individual welding processes
- Tool recognition with automatic program selection
- Monitoring of parameters and the number of welding processes

- Fan control
- Temperature management
- Protection against short-circuit, no-load operation and overload
- RS-232 and RS-485 interface
- USB service interface
- Ethernet interface via touch PC
- Optional PROFINET interface

#### **MAINS CONNECTION**

- Mains:
- 230 V: open cable ends or country-specific connectors; in Germany Schuko plugs
- 400 V: IEC 60309 CeKon

#### Device:

- Permanent wiring

#### WEIGHT AND DIMENSIONS

- Weight: 12 kg
- H x W x D: 235 x 270 x 440 mm

#### FREQUENCIES, POWER OUTPUTS AND INPUT VOLTAGES

SAPHIR									
	400 W	600 W	800W	1000W	1200 W	1500 W	2000 W	4000W	5000W
20 kHz	230 V	230 V	230 V	400 V	400 V				
30 kHz	230 V	230 V							
35 kHz	230 V								



2.0 WELDING GENERATORS | WEBER ULTRASONICS

The powerful Sonic Digital HS2 welding generators are the first-choice generators for industrial installations. Flexible installation, easy integration into control processes, high efficiency and compatibility with other system components make the generators an attractive option for large systems.

## SONIC DIGITAL HS2 AND SONIC DIGITAL HS2 4000

#### **WELDING GENERATORS**

The HS2 generators are welding specialists equipped with five welding modes (Weld by Remote, Weld by Time, Weld by Energy, Weld by Peak Power, Weld by Pulse) and up to 99 individual welding processes, which realise every welding procedure with aplomb.

The scan function automatically determines the resonant frequencies of the connected transducer systems and the optimum starting frequency. Moreover, PROFINET or PROFIBUS interfaces facilitate easy integration into control processes and remote maintenance.

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- Sonic Digital technology as a DIN rail-compatible system variant that can be integrated into existing installations
- High power output of up to 2000 watts (HS2)
- High power output of up to 4000 watts (HS2 4000)
- SonoScan
- Digital frequency generation and control through 32-bit microcontroller
- Electronic amplitude control from 50 % to 100 %
- Programmable operating parameters for up to 99 individual welding processes

- Monitoring of parameters and the number of welding processes
- Fan control
- Temperature management
- Protection against short-circuit, no-load operation and overload
- 15-pole I/O interface
- 2 x 9-pole I/O interface
- Optional: setting and control via the Sonic Digital hand-held control unit or the Sonic Digital front control panel
- Optional: RS-485 interface
- Optional: PROFIBUS or PROFINET interface

#### MAINS CONNECTION

HS2 mains connection

 - 115 V / 230 V: open cable ends or country-specific connectors; in Germany Schuko plugs

HS device

- 115 V / 230: Phoenix

#### WEIGHT AND DIMENSIONS

HS2

- Weight: 4 kg

- H x W x D: 385 x 169 x 89 mm

HS2 4000

- Weight: 8 kg
- H x W x D: 450 x 163 x 182.5 mm

#### FREQUENCIES, POWER OUTPUTS AND INPUT VOLTAGES

SONIC DIGITAL HS2									
	400 W	600 W	800 W	1000 W	1200 W	1500 W	2000 W	4000W	
20 kHz	115/230 V								
30 kHz	115/230 V								
35 kHz	115/230 V	115/230 V	115/230 V	115/230 V					
40 kHz	115/230 V	115/230 V	115/230 V						

### SONIC DIGITAL MG BASIC

#### **MODULAR WELDING GENERATOR**



The Sonic Digital MG Basic module generator offers you the proven technology from the Sonic Digital line featuring a wide range of applications with 20 to 40 kHz and 400 to 2000 watts and is ideally suited for use with other devices in machine networks.

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- Modular Sonic Digital technology
- Operation on the device and the display (Premium version)
- SonoScan
- Digital frequency generation and control through 32-bit microcontroller
- Electronic amplitude control from 50 % to 100 %
- Programmable operating parameters for up to 99 individual welding processes
- Monitoring of parameters and the number of welding processes
- Fan control
- Temperature management
- Protection against short-circuit, no-load operation and overload
- 15-pole I/O interface (TTE28 housing for up to 2 modules),
- 2 x 15-pole I/O interface (TTE84 housing for up to 6 modules)
- Optional: setting and control via the Sonic Digital hand-held control unit or the Sonic Digital front control panel
- Optional: RS-485 interface

#### **MAINS CONNECTION**

#### Mains

- TTE28 housing for up to 2 modules, 230 V: open cable ends or country-specific connectors; in Germany Schuko plugs
- TTE84 housing for up to 6 modules, 400 V: IEC 60309 CeKon

#### Device:

- Permanent wiring

#### **WEIGHT AND DIMENSIONS**

Sonic Digital MG module

- Weight: 3 kg
- H x W x D: 174 x 71.5 x 308 mm

#### Module in TTE28 housing

- Weight: 6 kg
- H x W x D: 235 x 205 x 400 mm

#### Module in TTE84 housing

- Weight: 7.5 kg
- H x W x D: 235 x 530 x 400 mm

## SONIC DIGITAL MG PREMIUM

MODULAR WELDING GENERATOR



It is even easier to control the Premium variant of the Sonic Digital MC as you can make all settings directly on the device and view current system processes and notifications on the display.

#### FREQUENCIES, POWER OUTPUTS AND INPUT VOLTAGES

SONIC DIGI	SONIC DIGITAL MG									
	400 W	800 W	1000W	1200 W	1500 W	2000W				
20 kHz	230/400 V	230/400 V	230/400 V	230/400 V	230/400 V	230/400 V				
30 kHz	230/400 V	230/400 V	230/400 V	230/400 V						
35 kHz	230/400 V	230/400 V	230/400 V							
40 kHz	230/400 V	230/400 V								



Up to six modules in a single TTE84 housing

### **SONIC DIGITAL LC**

**WELDING GENERATOR** 



### SONIC DIGITAL ULC

**WELDING GENERATOR** 











#### **BASIC**

As a tabletop unit, the Sonic Digital LC Basic is particularly compact and ideal for use in combination with a hand-held welding unit. To this end, it can cover a wide range of applications with 20 to 40 kHz and 400 to 2000 watts.

#### **PREMIUM**

The Sonic Digital LC Premium from the Sonic Digital family offers additional setting options directly on the device. The system status and important notifications can be viewed on the display.

#### **TECHNOLOGIES. FUNCTIONS. ADVANTAGES**

- Sonic Digital technology as a stand-alone/tabletop unit
- Operation on the device and the display (Premium version) - SonoScan
- Digital frequency generation and control through 32-bit microcontroller
- Electronic amplitude control from 50 % to 100 %
- Programmable operating parameters for up to 99 individual welding processes
- Monitoring of parameters and the number of welding processes
- Fan control
- Temperature management
- Protection against short-circuit, no-load operation and overload - 15-pole I/O interface
- Optional: setting and control via the Sonic Digital hand-held control unit
- Optional: RS-485 interface

#### **BASIC**

The Sonic Digital ULC offers you the technology of the market leader. The particularly economical tabletop unit is ideal for use with a hand-held welding unit and comes with SonoScan and digital frequency generation.

#### **PREMIUM**

The Sonic Digital ULC Premium, a convenient tabletop unit from the Sonic Digital family, offers a variety of setting options and the ability to view the system status and notifications directly on the device.

#### **TECHNOLOGIES. FUNCTIONS. ADVANTAGES**

- Sonic Digital technology as a stand-alone/tabletop unit
- Operation on the device and the display (Premium version)
- SonoScan
- Digital frequency generation and control through 32-bit microcontroller
- Electronic amplitude control from 50 % to 100 %
- Programmable operating parameters for up to 99 individual welding processes
- Monitoring of parameters and the number of welding processes
- Fan control
- Temperature management
- Protection against short-circuit, no-load operation and overload
- 15-pole I/O interface
- Optional: setting and control via the Sonic Digital hand-held control unit
- Optional: RS-485 interface

#### **MAINS CONNECTION**

- IEC 60320 appliance socket C13

#### Mains:

Device:

- Open cable ends or country-specific connectors; in Germany Schuko plugs

## WEIGHT AND DIMENSIONS

- Weight: 5.5 kg
- H x W x D: 130 x 250 x 270 mm

#### MAINS CONNECTION

#### Mains:

- Open cable ends or country-specific connectors; in Germany Schuko plugs

### Device:

- IEC 60320 appliance socket C1

#### **WEIGHT AND DIMENSIONS**

- Weight: 2.8 kg
- H x W x D: 75 x 250 x 180 mm

#### FREQUENZEN, LEISTUNGEN & EINGANGSSPANNUNGEN

SONIC DIGITAL LC									
	400 W	800 W	1000 W	1200 W	1500 W	2000W			
20 kHz	230 V	230 V	230 V	230 V	230 V	230 V			
30 kHz	230 V	230 V	230 V	230 V	230 V				
35 kHz	230 V	230 V	230 V						
40 kHz	230 V	230 V							

#### FREQUENCIES, POWER OUTPUTS AND INPUT VOLTAGES

SONIC DIGITAL ULC								
	200 W	400 W						
25 kHz	230 V	230 V						
30 kHz	230 V	230 V						
40 kHz	230 V	230 V						

Information on 115 V version available on request

## SONIC DIGITAL FRONT CONTROL PANEL

#### FOR CONTROL CABINETS AND ENCLOSURES



The practical front control panel for Basic generators can, for example, be fitted in the door of a control cabinet. All settings can be made directly here and the current operating parameters viewed.

#### FRONT CONTROL PANEL



## SONIC DIGITAL HAND-HELD CONTROL UNIT



#### FOR BASIC GENERATORS

The practical hand-held control unit for all generators without display allows all settings to be made and the current operating parameters to be viewed. Suitable for all Basic generators in the Sonic Digital range and HS2.

#### **PROFINET BOX**



#### INTERFACE CONVERTER

An interface converter can ensure compatibility with PROFINET systems for the quick and easy integration of generators with the RS-485 interface.

3.0 OPERATION AND INTERFACES | WEBER ULTRASONICS

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- The interface converter is preconfigured for the specific generator and system
- Conversion to PROFIBUS is also possible on request
- DIN rail installation
- With LED status display
- Supplied with device description file

## **HSM HAND-HELD WELDING MODULE**



#### THE HSM HAND-HELD WELDING MODULE IS SUITABLE FOR

#### AGILE WELDING APPLICATIONS IN TIGHT SPACES,

for small series or prototypes: The ergonomically designed tool is splash-proof and excels through its durability. You always receive the HSM individually configured with the welding sonotrode manufactured specifically for your application.

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- Operating modes: time, power output, energy
- Hand-held module is available in gun or rod form
- Optional: lighting and/or plug-in control and HF feed as well as converter and sonotrode cooling

#### COMPATIBILITY

- All generators in the Sonic Digital range

#### FREQUENCIES AND POWER OUTPUTS

HSM HAND-HELD WELDING DEVICE									
	200 W	400 W	600 W	800 W					
35 kHz	х	х	х	х					





## **CONVERTERS**

We offer you converters for all standard frequencies (20 to 40 kHz) and power classes (200 to 5000 watts). Their titanium-aluminium alloy finish makes them particularly durable. Available in planar form together with a matching booster or in a fixed-mounted version for direct connection of the sonotrodes.

#### **TECHNOLOGIES. FUNCTIONS. ADVANTAGES**

- High power output of up to 5000 watts
- Made of titanium

#### **FREQUENCIES AND POWER OUTPUTS**

CONVERTERS											
	200 W	400W	600 W	800 W	1000 W	1200 W	1500 W	2000 W	3000 W	4000 W	5000 W
20 kHz	x	x	x	х	x	x	x	x	x	x	x
30 kHz	x	x	x	x	x	x	x	×			
35 kHz	x	x	x	x	×	х					
40 kHz	х	х	х	х	х						

### **BOOSTERS**

Boosters or amplitude transformation units serve as a bridge between the converter and sonotrode, transferring the oscillations and allowing the operating frequency to be precisely adapted to a very wide range of applications.

#### **TECHNOLOGIES, FUNCTIONS, ADVANTAGES**

- Made of titanium
- Equipped with mounting bracket for the transducer system

#### **FREQUENCIES**

#### TRANSFORMATIONS

- 20 kHz - 1:0.6 - 30 kHz - 1:0.8 - 35 kHz - 1:1

- Further frequencies available - 1:1.25 on request - 1:1.5 - 1:2

> - 1:2.5 - Optional: 1:3



## **SONOTRODES**

Welding sonotrodes are always developed according to customer- and product-specific requirements using the finite element method. High-grade materials such as aluminium alloy, titanium or sintered steel are used in their production.

#### **FREQUENCIES**

- 20 kHz - 35 kHz - 25 kHz - 40 kHz - 30 kHz

#### **TECHNOLOGIES, FUNCTIONS AND ADVANTAGES**

- Designed using the finite element method
- Manufactured from a high-strength aluminium alloy, titanium or sintered steel



#### **QUICK-CHANGE MODULE**



To facilitate quick, easy and secure replacement of the entire transducer unit and avoid operator errors, we use indexed positioning mechanisms for our quick-change modules.

#### TECHNOLOGIES, FUNCTIONS AND ADVANTAGES

- Changing of the entire transducer unit
- Indexed positioning
- Faster and more reliable tool changeover for different welding tasks at a single workplace

#### **WORKPIECE HOLDERS**



We manufacture workpiece holders individually for customers based on CAD data or original parts. They can, for example, be produced from cast resin, steel, aluminium or brass. Custom fixtures such as clamping mechanisms, ejectors or similar are also possible.

#### TECHNOLOGIES, FUNCTIONS AND ADVANTAGES

- Manufacturing based on CAD data or original parts
- Made of cast resin, steel, aluminium or brass
- Special devices such as tensioning mechanisms, ejectors or split mounting fixtures are possible



2 WEBER ULTRASONICS AG

Headquarters, Karlsbad, Germany

## GLOBAL PLAYER, LOCAL SUPPORT

YOUR PARTNER FOR GREATER ADDED VALUE THROUGH EFFICIENT CLEANING PROCESSES

3 WEBER ENTEC GMBH & CO. KG Waldbronn, Germany WEBER ULTRASONICS AMERICA LLC 1 Clarkston, Michigan, United States of America WEBER ULTRASONICS AG 5 Tech Center Thailand, Khlong Luang WEBER ULTRASONICS ASIA SDN. BHD. 4 Shah Alam, Selangor, Malaysia Weber Ultrasonics is a global player that is deeply rooted in Ger-

man quality traditions. The company has a flawless track record and has realised over 2000 projects for more than 1500 customers all over the world. In-depth expertise, an intensive development phase, exhaustive testing in the Group's own application centre, quality-controlled manufacturing in Germany, regional sales offices close to our customers and the very best on-site service guarantee solutions that maximise added value for our customers.





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